

name of *P. coronata* on the same page, and figured in the 'Genera of Recent Mollusca' by Messrs. H. and A. Adams on pl. xiv. fig. 1.

Mr. E. W. H. Holdsworth has recently presented to the British Museum a series of shells which he had collected in Ceylon; and among them are three specimens of *Pinaxia*, two of which have the operculum preserved. It is horny, stained with pinkish colour, and of the usual form that obtains among the *Purpurinæ*, and thus shows that this genus has been rightly located by the above authors. The small transverse plaits on the columella (about six in number) appear to exist only in the adult shell; and the same remark applies to the fine lirations within the aperture.

In a variety from the Sandwich Islands the coronation which edges the spire in the typical form is totally wanting, the general form is more bulbous, and the spiral lirations are but slightly raised. The deciduous epidermis is villose and of a pale olive colour.

In 1839, in the 'Zoology of Beechey's Voyage,' p. 114, Dr. Gray described a shell from the Pacific Ocean under the name of *Pygula versicolor*. The description is excellent; but by an oversight or printer's error, the colour is stated to be "*bright crimson*," which no doubt should have been *bright orange*. The specimen from which the description was taken, although a large one, is not adult; and consequently the character of the plaits on the columella is not mentioned. Taking these two circumstances into consideration, I think it will be advisable to adopt the more recent name *coronata*.

Perhaps this may be a fitting opportunity to acquaint conchologists that one of the last, and not least, of the innumerable acts of generosity of the late deeply lamented Dr. Gray was the presentation by him to the British Museum of his private collection of shells. How valuable an acquisition to the National Collection this is will at once be acknowledged, as it comprises a large number of types of his species which were described many years ago in the *Zoology of 'Beechey's Voyage,'* Griffith's edition of Cuvier's '*Animal Kingdom*,' the '*Annals and Magazine of Natural History*,' the '*Zoological Journal*,' the '*Zoological Miscellany*,' &c. A number of these species are but briefly characterized and unfigured; so that in the present state of conchological science it is almost impossible to recognize them, at least with any degree of certainty, except by comparison with the actual types. Thus the value of the collection becomes greatly enhanced.

*On the general Phenomena of the Embryogeny of the Nemertians.*

By M. J. BARROIS.

Amongst the numerous obstacles which one encounters at each step in researches in embryogeny, there is none more serious than that presented by the multiplicity of the larval forms in the same group of animals. These divergences, often very great in the first stages of development, prevent us from taking these as a starting-point in the appreciation of the subsequent phenomena; conse-

quently any deduction drawn from the mode of development becomes impossible, and embryogeny (that powerful aid to anatomy) seems to fail entirely.

It is therefore of the greatest importance to obtain a knowledge of the mutual relations which unite these different larval forms. It is thus that Fritz Müller has shown, by the embryogeny of *Peneus*, the bonds which unite the *Nauplius* and the *Zoëa*.

Of all the groups which present this mode of complication, the Nemertians certainly show one of the most remarkable cases. Side by side with the form *Pilidium*, which constitutes one of the most typical examples of geneagenesis, numerous larvæ occur, which, without any analogous phenomenon, pass directly to the adult state. On the one hand we have a transparent animal furnished with elegant extensions and ciliated bands, which the older observers very naturally compared to the well-known larvæ of the Echinoderms. From this first sketch originates, by internal budding, the future *Nemertes*, which, as soon as it is formed, quits its nurse to live an independent life. On the other hand, again, we see a small ciliated very simple larva issue from the egg, a simple oval body, differing but little in appearance from the egg which gave it birth (the larva of Desor), and which, without any other perceptible phenomenon except a mere differentiation of tissues, is gradually transformed into a complete *Nemertes*.

During a residence of several months last summer at the Zoological Laboratory of Wimereux, directed by Professor Giard, I was enabled to study this question in a connected manner; and it is the results of my researches on this subject that I have the honour of communicating to the Academy.

Together with a great number of unimportant forms of the larvæ of Desor, which reach their complete development gradually without presenting any abnormal phenomenon, I had the good fortune to meet with some forms of great interest, which, besides a great number of very instructive facts, have furnished me with the transition term between the two modes of development, so different in appearance, the *Pilidium* and the larva of Desor.

Among all the species which I have observed, the most remarkable is without question a species very common at Wimereux, and which I have been able to follow in a very detailed manner in all the phases of its evolution, namely *Nemertes communis* (Van Bened.). Although reproducing in its development all the essential peculiarities which characterize the *Pilidium*, this species presents a very marked approach towards the simpler states, and offers incontestable analogies to the larva of Desor.

I reserve for a more extended memoir the details relating to the very curious processes which give origin to the various systems of organs of the Nemertians; I only desire now to call attention to a main point, the passage from the *Pilidium* to the larva of Desor.

It is known, from the recent researches of Kowalevsky and Metschnikoff, that in the *Nemertes* with a *Pilidium* the spheres of segmentation of the egg arrange themselves very early radiately around a central cavity, which is at first very small; this latter

enlarges rapidly and drives all the cells towards the periphery, so as to constitute a superficial membrane. There is thus produced a closed vesicle, with the wall formed of a single series of cells (*blastosphæra*). This vesicle becomes invaginated and gives origin to a double-walled sac (*Gastrula*); it is at this stage that hatching takes place. The *Gastrula* breaks through the vitelline membrane and begins to swim freely in the liquid. Then commences an interruption in the development, during which the larva, adapting itself to pelagic life, acquires all the different peculiarities characteristic of the *Pilidium*. It is only after this interruption, corresponding to the duration of independent life, that the development commences which is to lead to the formation of the *Nemertes*. There is here, evidently, an exaggeration of a larval state followed by a return to the type.

To form the *Nemertes* [from the *Pilidium*], four little invaginations take place at the expense of the exoderm; these detach themselves and produce four vesicles which fall into the cavity of the body of the *Pilidium*, where they become flattened and are transformed into hollow disks, formed of a thin external lamella turned towards the exoderm, and a thick internal lamella turned towards the endoderm. These four disks soon meet, surrounding the intestine, join together, and coalesce, and thus form a double membrane around the intestine: the inner membrane, formed by the junction of the inner lamellæ of the disks, will become the skin of the *Nemertes*; the outer one, formed by the coalescence of the external lamellæ, will constitute a provisional membrane, the amnios, which will disappear at the same time as the skin of the *Pilidium* to set the *Nemertes* at liberty.

Without being actually identical, the resemblance of the development of our *Nemertes* to that which we have just indicated is great enough to exclude all confusion between the two forms described. As before, the first stages of development are characterized by the presence of a blastosphere which becomes invaginated to give origin to a *Gastrula*. In the same way, the formation of the *Nemertes* is accomplished, in general, by means of the envelopment of the intestine by large discoidal lamellæ, which become confluent and unite by their edges to constitute the skin of the *Nemertes*. Finally, the primitive exoderm is destroyed, and the animal formed in its interior is set at liberty. But there the analogy stops. Our *Nemertes*, in fact, presents some important peculiarities which remove it from the *Pilidium* to bring it nearer the larva of Desor. We have, in the first place, the absence of pelagic life and of the interruption of the development which results from it. Here all the development is performed, from beginning to end, in the interior of the egg, and the animal which issues from it has already acquired the characteristic form of the *Nemertes*. Besides this fundamental fact, we see also that there is an evident simplification of the embryogeny and a gradual progress towards the extreme condensation which is observed in the larva of Desor. The stage which corresponds to the *Pilidium* has already lost all the different characteristic appendages which result from life in a free state, and is reduced to a simple *Gastrula* covered with fine vibratile cilia.

Lastly, we can prove the disappearance of one of the two embryonic membranes, the amnios. The disks which surround the digestive tube are not here composed of hollow sacs, but of solid lamellæ; so that a single membrane, the skin of the *Nemertes*, results from their union. In a word, we see manifested under our eyes a remarkable tendency to the suppression of the exaggeration of the larval state which constitutes the *Pilidium*, and to a return to the direct mode of development.

Here, then, we have, by the side of a development very like that of the *Pilidium*, a very great simplification and an evident condensation of the embryogeny. One step further and we arrive at the extreme condensation which is observed in the larvæ of Desor. We have therefore before us an intermediate stage between the *Pilidium* and the larva of Desor; and this result seems to be of incontestable importance. It enables us to correlate the two widely different forms of the embryos of the Nemertians, and shows us that the mutual relations which exist between them are analogous to those which Fritz Müller has informed us exist between the *Nauplius* and the *Zoëa*. Like the *Nauplius*, the *Pilidium* is the primitive form; and the larva of Desor represents a condensed form derived from the former by the abbreviation of the embryogeny.—*Comptes Rendus*, January 25, 1875, pp. 270–273.

*On the Reproductive Organs of the Eels.* By M. SYRSKI.

In 1872 two memoirs appeared almost simultaneously by Italian authors, who announced that they had discovered that the eels are hermaphrodites. The agreement in general results was certainly adapted to inspire some confidence; but, on the other hand, considerable divergences in the descriptions of the organs showed that the question was far from being completely cleared up. These differences might arise from errors of observation; or they might be ascribed to differences of organization due to the species, age, or sex of the fishes examined.

According to M. Syrski all that relates to the male organs in these two memoirs is completely erroneous, and the eels are not hermaphrodites at all; MM. Balsamo-Crivelli and Maggi were the subjects of an illusion when they thought they had ascertained the presence of spermatozoids; the organs regarded by them as the testes are nothing more than fatty bodies.

Notwithstanding the assertions of the preceding authors, and the gap which exists in the researches of M. Syrski, the probabilities seem to be entirely in favour of the unisexuality of the eels.

In these fishes the males are smaller than the females. Eighty-six individuals, 218–430 millims. in length, examined by M. Syrski proved to be males; and ninety others, 275–1050 millims. long, were females. The previous observers having preferred examining large individuals, had only females under their inspection.

The testes appear as nearly symmetrical paired organs, in the form of long ribbons, attached, like the ovaries, along the dorsal wall of the abdominal cavity. That of the right side commences a